(19) Japanese Patent Office (JP)

(12) Publication of Unexamined Patent Application (KOKAI) (A)

(11) KOKAI Number: S60-243681

(43) KOKAI Date: 3 December 1985

(54) Int. Cl[4]	Identification Symbol	JPO File No.
G 03 G 15/08	112	7015-2H

Requests for examination filed: No requests filed

Number of Inventions: 1 (3 pages total)

---

(54) Title of the Invention: Toner Replenishing Device

(21) Application Number: S60-14342

(22) Filing Date: 18 May 1984

(72) Inventor:

Shigeyuki MIYA
Matsushita Electric Industrial Co., Ltd.
1006 Kadoma, Oh-aza, Kadoma City

(72) Inventor:

Masao NAKAZAWA
Matsushita Electric Industrial Co., Ltd.
1006 Kadoma, Oh-aza, Kadoma City

(72) Inventor:

Naoyuki UENISHI
Matsushita Electric Industrial Co., Ltd.
1006 Kadoma, Oh-aza, Kadoma City

(71) Applicant:

Matsushita Electric Industrial Co., Ltd.
1006 Kadoma, Oh-aza, Kadoma City

(74) Agent: Toshio NAKAO, Patent Attorney; and one other

SPECIFICATION

1. Title of the Invention: Toner Replenishing Device

2. Claim

A toner replenishing device provided with
a cylindrical hollow vessel with
both ends sealed,
a projection formed in at least one of said ends, and
a lengthwise opening on the outer surface,
and a toner hopper with
an opening and closing cover in the top portion,
a toner feed opening in the bottom portion,
a toner replenishing roller provided within said toner feed opening, and
a rotating member fitting to said projection on said hollow vessel,
said toner replenishing device characterized by
said toner hopper opening and closing cover interlocking with said rotating member, and
rotating said hollow vessel by operating the opening and closing cover with said projection on said hollow vessel fitted to said rotating member,
orienting said opening on said hollow vessel to oppose said toner feed opening, thereby
replenishing the interior of a toner hopper with toner from within said hollow vessel.

3. Detailed Explanation of the Invention

Technical Field

The present invention concerns a toner replenishing device in a developing device which visualizes an electrostatic latent image in an electrophotographic copying device or an electrostatic recording device.

Constitution and Problems of Prior Art

In the electrophotography method, toner is used to visualize (develop) an electrostatic latent image formed on the photoconductive surface of a photosensitive body, and this toner image is transferred and secured onto a transfer member to obtain an image. Conventional methods to develop an electrostatic latent image have included the cascade method or the magnetic brush method. Two-ingredient developer, which is a mixture of a carrier such as iron powder and a non-magnetic toner such as colored resin powder has been used as the developer. Also, in recent years, non-magnetic toner is being replaced by magnetic toner containing magnetic powder within the colored resin powder, or single-ingredient developer which uses the magnetic toner alone.

However, when replenishing conventional developing devices with dry developing powder such as non-magnetic toner or magnetic toner, toner was manually supplied into a hopper in the developing device from a toner container such as a jar. Therefore, toner would spill easily, and toner powder was inevitably scattered.

Therefore, use of a toner cartridge for replenishing toner has been proposed in order to resolve said shortcoming, but problems with conventional toner cartridges included having a complex toner cartridge structure, and a difficult toner replenishing operation.

Purpose of the Invention

The purpose of the present invention is to provide a toner replenishing device which eliminates the shortcomings of prior art, with a simple structure and a toner replenishing operation which is one-touch and secure, enabling a replenishing operation without soiling the hands of the operator or scattering toner in the vicinity.

Constitution of the Invention

The toner replenishing device in the present invention is composed with a cylindrical hollow vessel with both ends sealed, a projection formed in at least one of said ends, and a lengthwise opening on the outer surface, and a toner hopper with an opening and closing cover in the top portion, a toner feed opening in the bottom portion, a toner replenishing roller provided within said toner feed opening, and a rotating member fitting to said projection on said hollow vessel, said toner replenishing device characterized by said toner hopper opening and closing cover interlocking with said rotating member, and rotating said hollow vessel by operating the opening and closing cover with said projection on said hollow vessel fitted to said rotating member, orienting said opening on said hollow vessel to oppose said toner feed opening, thereby replenishing the interior of a toner hopper with toner from within said hollow vessel.

Explanation of Embodiment

An embodiment of the present invention is explained below, referencing drawings. Figure 1 is a section view of an example of a hollow vessel for replenishing toner, used in this invention. Figure 2 is a section view of one embodiment of the toner replenishing device in the present invention, and Figure 3 is a partial section isometric view for explaining the toner replenishing operation.

In Figure 1, 1 is a hollow vessel for replenishing toner, [said vessel] comprising non-magnetic material such as paper or plastic, with an opening 2 provided lengthwise in its outer surface. The opening 2 is sealed with a seal 3 which can easily be peeled by hand. A flange 4 and a flange 5 are secured on either end of the hollow vessel 1. A projection 6 is provided on the exterior center of the flange 4 on one end, and a cap 7 is fitted into an orifice opened in the flange 5 on the opposite end. Further, a protrusion 8 is formed on the center exterior of the cap 7. A sheet-shaped tab 9, formed of polyethylene resin or

other material which can be bent at a thin portion 9a in the directions of arrows a and b, is movably fitted to the protrusion 8. The cap 7 is installed after toner 24 is placed in the hollow vessel 1.

In Figure 2, a toner hopper 10 for containing said hollow vessel 1 is provided with a toner feed opening 13 comprising a housing 11 and a support member 12 supporting the hollow vessel 1 in its interior. The toner feed opening 13 shape is either identical to said opening 2, or is formed somewhat larger. Toner sealing material 14 comprising sponge or other material is installed around the toner feed opening 13. a toner stirring member 15 constituted of a spring, etc. is installed to the lower portion of the toner feed opening 13. Several toner replenishing rollers 16 comprising magnetic material are arranged in the bottom of the toner hopper 10. Also, a gap 17 is provided between the toner replenishing rollers 16 and the housing 11, and a scraping plate 18 is installed opposite the gap 17. At the top portion of the toner feed opening 13, there are installed a rotating member 20 in which a notch 19 is formed such that [said notch] fits together with the projection 6 on said hollow vessel 1, a stopper 21 regulating the rotation range of the rotating member 20, and an opening and closing cover 22 at the very top of the toner hopper such that [said cover] can open and close in A and B directions. Also, the opening and closing cover 22 is connected to the rotating member 20 via a link 23.

Thus, the composition is such that, by rotating the opening and closing cover 22, the rotating member 20 interlocks and rotates, and the opening 2 on the hollow vessel 1 fitted into the notch 19 reverses its upward/downward orientation. Though a link 23 was used in this embodiment, [this invention] could also be embodied using a gear, a wire, etc.

The operation of this embodiment of the toner replenishing device with said composition is explained below, referencing Figure 3.

First, the opening and closing cover 22 of the toner hopper 10 is opened, and the hollow vessel 1 is inserted such that the protrusion 6 fits into the notch 19. Next, the seal 3 is peeled from the opening 2 which is oriented upward, and the opening and closing cover 22 is closed. This rotates the rotating member 20 which is connected with the link 23, along with which the opening 2 of the hollow vessel 1 is oriented downward, opposite the toner feed opening 13, and the toner hopper 10 is replenished with the toner 24 in the hollow vessel 1. Also, when exchanging the hollow vessel 1, the opening and closing cover 22 is opened, and the tab 9 on one end of the hollow vessel 1 is pulled upward, as [said tab] is always oriented toward the top portion of the toner hopper 10.

Effects of the Invention

As shown above, the present invention has the excellent superior effects of a toner replenishing device with a simple structure, and a toner replenishing operation which is one-touch and secure, enabling a toner replenishing operation without soiling the hands of the operator or scattering toner in the vicinity.

4. Simple Explanation of Drawings

Figure 1 is a section view of an example of a hollow vessel for replenishing toner, used in this invention. Figure 2 is a section view of one embodiment of the toner replenishing device in the present invention, and Figure 3 is a partial section isometric view for the present invention.

1. Hollow vessel
2. Opening
3. Seal
4. Flange
5. Flange
6. Projection
7. Cap
8. Protrusion
9. Tab
10. Toner hopper
11. Housing
12. Support member
13. Toner feed opening
14. Toner seal
15. Toner stirring member
16. Toner replenishing roller
17. Gap
18. Scraping plate
19. Notch
20. Rotating member
21. Stopper
22. Opening and closing cover
23. Link
24. Toner

Name of Agent: Toshio NAKAO, Patent Attorney; and one other

Figure 1

Figure 2

[upper right arrows]
B
A

Figure 3